

The first of these is the fact that the
 H^1 norm is not a norm on the space of
 functions vanishing at infinity. This is
 because the norm is not finite for all
 functions in the space. For example,
 the function $f(x) = 1/x$ is in the space,
 but its H^1 norm is infinite. This is
 because the integral of $1/x^2$ over the
 interval $(0, \infty)$ diverges.